Geographic Information System-based
Safety **A**nalysis, **V**isualization, and **E**xploration **R**esource
(GIS-**SAVER**)
for
Engineering, Enforcement, Education, Emergency Response, and Everyone else!
(GIS-**SAVER**:E^5)

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Intersection of

US 75 and Co. Rd. C38

Plymouth County

2000-2004

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SAVER Example

District 3 requested a crash history at the intersection of US 75 and Co. Rd. C38 in Plymouth County. Typically for intersections with more than 10 crashes a year, 3 years of crash history is used. For intersections with fewer than 10 crashes a year, 5 years worth of data is typically used. As you will be able to see when you view the data, this intersection has fewer than 10 crashes a year so we will be using 5 years worth of data(2000-2004). A Collision Diagram of the intersection will also be made.

This example will assume that the user has a basic knowledge of ArcView SAVER. If a more detailed example is desired see the Harrison County example.

Step 1: Open the SAVER Project

Start SAVER. Go to the ArcView pull-down menu and select Start SAVER.
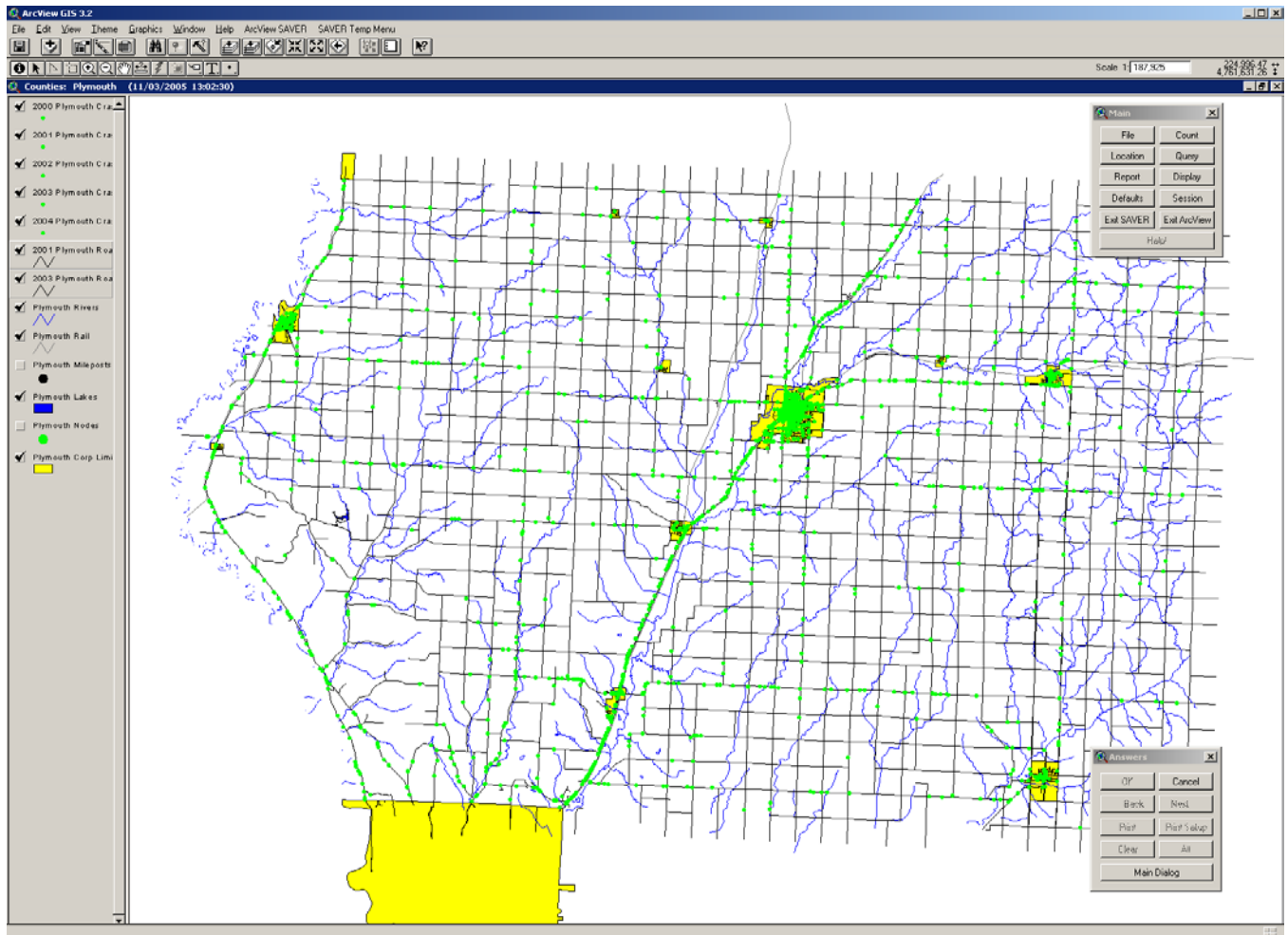
Click Continue at the about dialog box.

Open New Map

SAVER Example

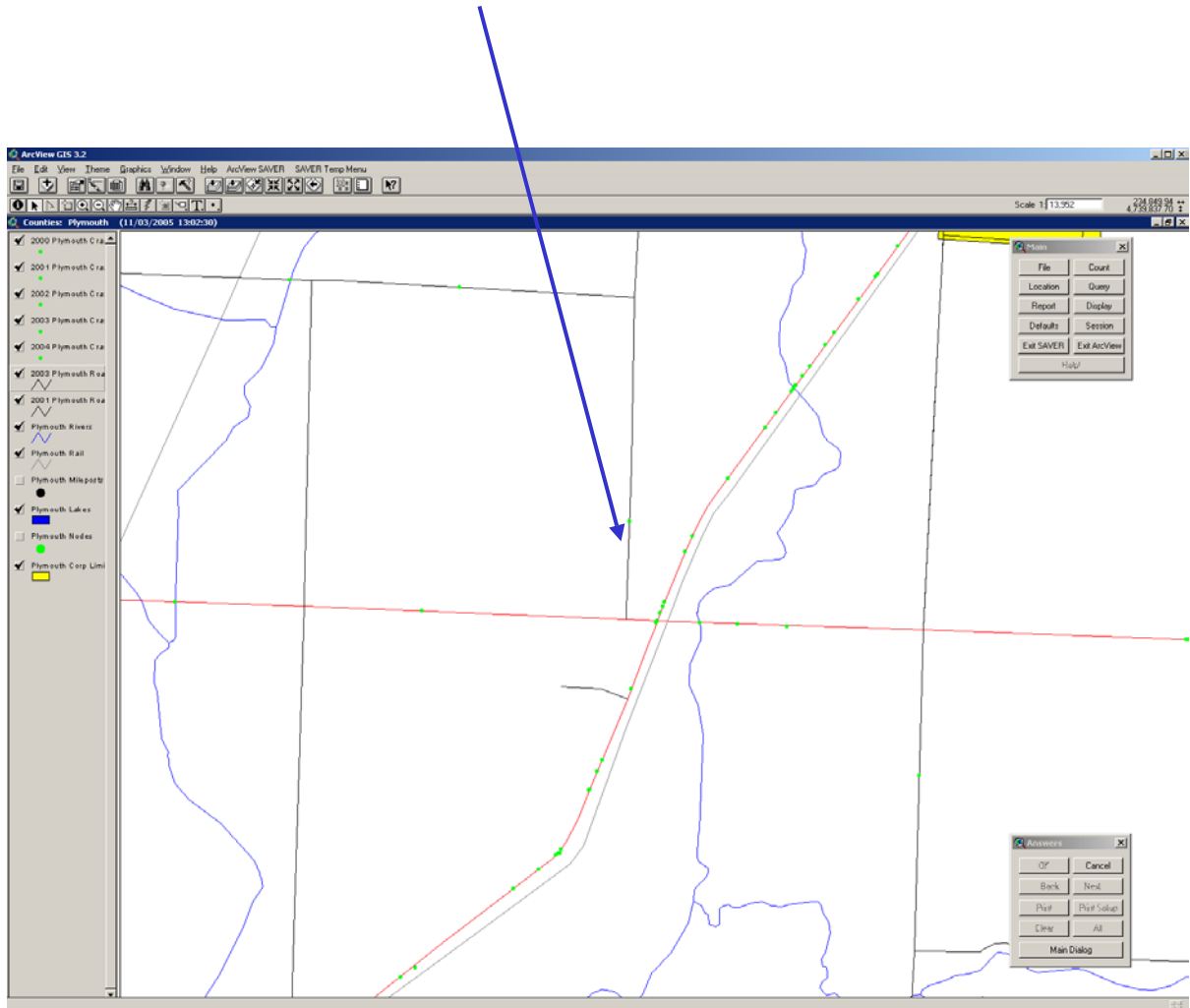**Next open up the Plymouth County map with the appropriate years of data(2000-2004).**

**To do this go to File>New>County and select Plymouth County. Click Next.
Select the years 2000-2004 and click next.**

You should see something similar to the following picture.

Find Location

SAVER Example

US 75 and Co. Rd. C38,
Plymouth County, 2000-2004

If you are unsure where these roads are located at in Plymouth County, you can use the Query Builder tool button to find them. Once you find the intersection of these two roads, zoom in closer to the intersection so that you can see what is going on better.

Select Crashes

SAVER Example

The next step is to select all of the crashes within 150' of the intersection. This is usually a good distance to use as most crashes within this distance of the intersection occur because of the intersection. A different distance may be used if the location or geometry of the intersection dictates so.

The easiest way to do this is to draw a circle with a radius of 150' at the intersection. The Draw Circle button can be selected from the Draw Point tool bar. The Select by Graphic Tool can then be used to select all crashes that are within the circle.

Draw Circle

Select Features Using Graphic

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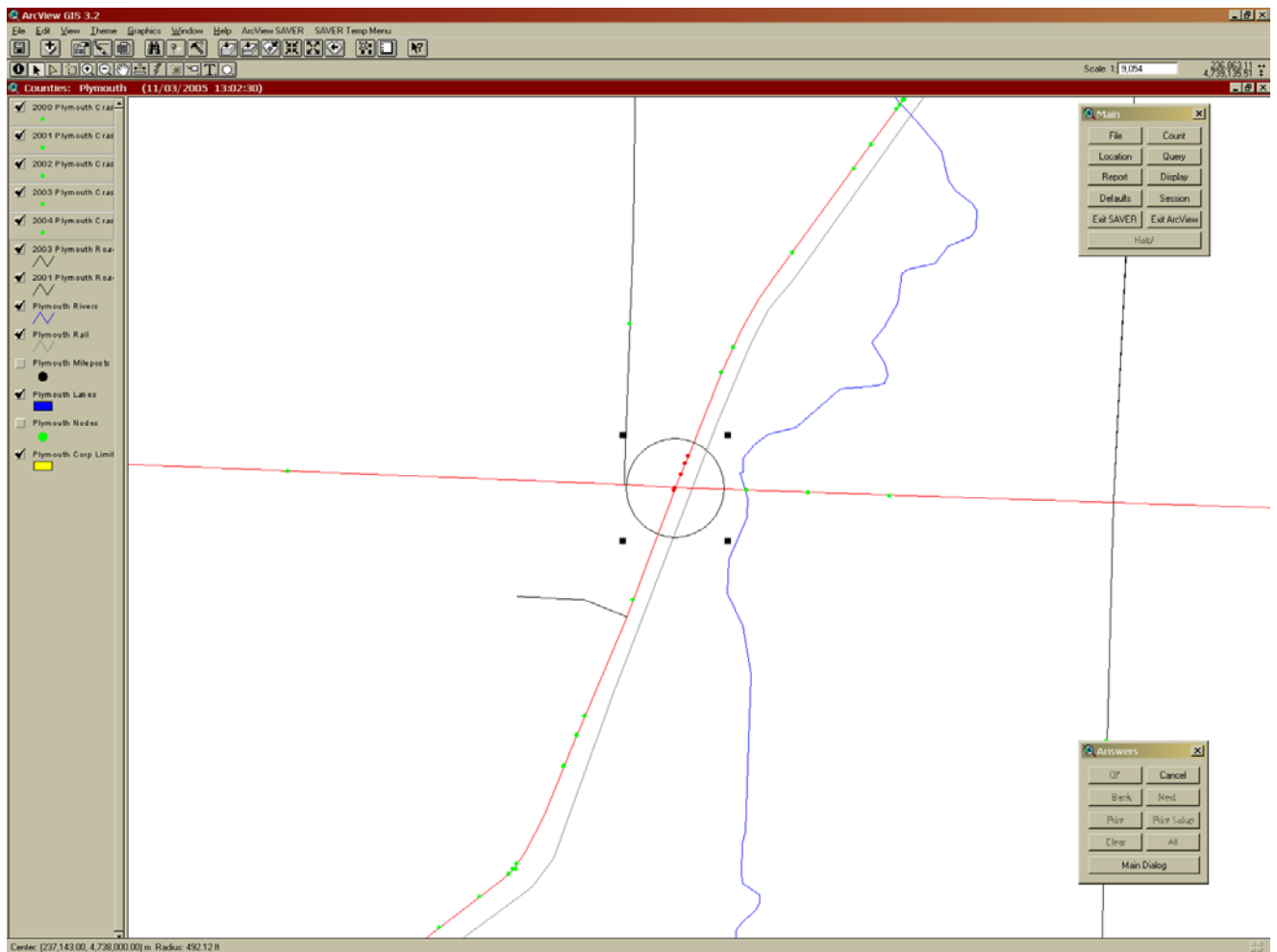
Save
Project

SAVER Example
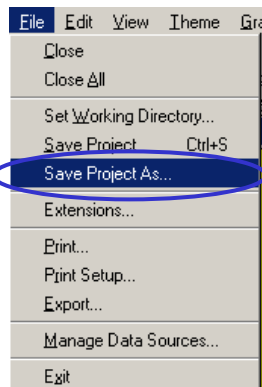
Periodically saving your work is a good idea. Occasionally, something will cause ArcView to shut down. If you haven't saved, your work will be wasted. To save an ArcView SAVER project, locate the File menu in the upper left of the ArcView window. Click on File and the menu will expand.
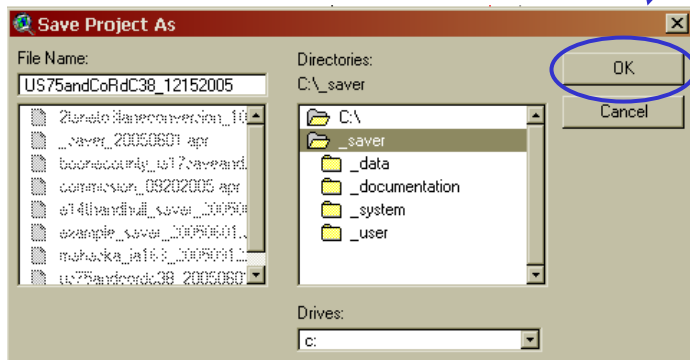
Click on Save Project As…
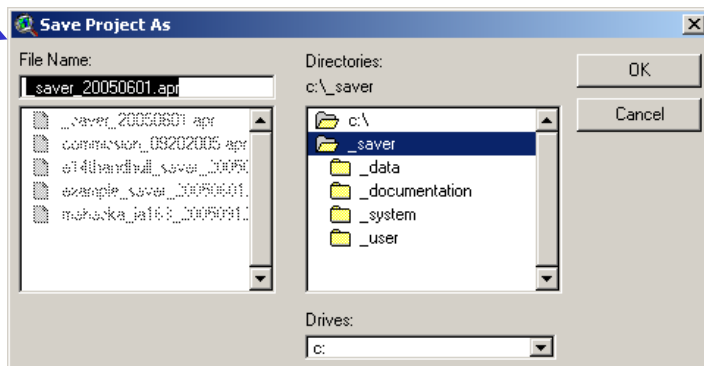
The Save Project As dialog appears with the name of the SAVER project visible and highlighted. Type in some other name which describes your current project. Updating the date may help you recall, months from now, what the project was.

Note: Clicking Save Project from the File menu or leaving the file name the same will overwrite the SAVER project. This will cause the current views, tables, etc. in the project to open the next time you open SAVER.

Note: Please only save the projects within the _saver directory. Saving them somewhere else could cause problems.

For this example, type in "US75andCoRdC38_<date>", where <date> is the current day's date.

When finished, Click OK and the project will save.
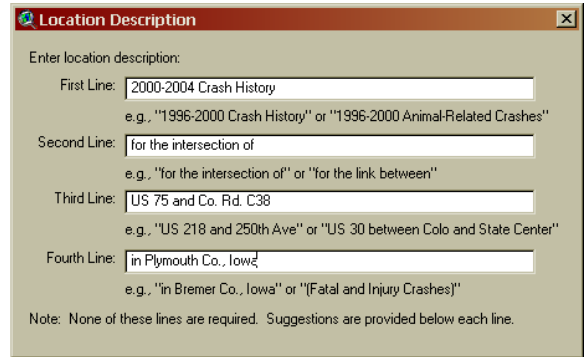
Note: To open this project later, first open the SAVER project, then choose the File menu, click on Open Project (available when the project window within ArcView is active), and locate your project file.

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Count Crash Frequencies, Severities, and Injuries

SAVER Example

From the Main dialog box click on Count. You can then enter descriptive information about the intersection. This is optional but advised. Then click Next in the Answers dialog box.
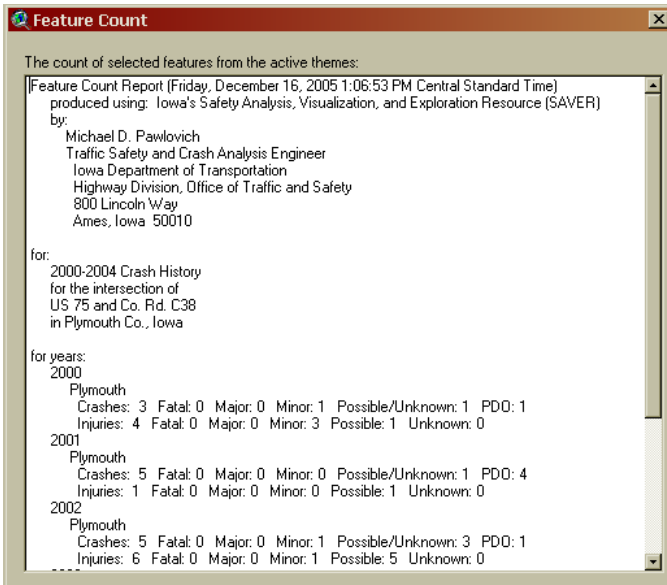
Location Description

Enter location description:

First Line: `2000-2004 Crash History`
e.g., "1996-2000 Crash History" or "1996-2000 Animal-Related Crashes"

Second Line: `for the intersection of`
e.g., "for the intersection of" or "for the link between"

Third Line: `US 75 and Co. Rd. C38`
e.g., "US 218 and 250th Ave" or "US 30 between Colo and State Center"

Fourth Line: `in Plymouth Co., Iowa`
e.g., "in Bremer Co., Iowa" or "(Fatal and Injury Crashes)"

Note: None of these lines are required. Suggestions are provided below each line.

Feature Count

The count of selected features from the active themes:

Feature Count Report (Friday, December 16, 2005 1:06:53 PM Central Standard Time)
produced using: Iowa's Safety Analysis, Visualization, and Exploration Resource (SAVER)
by:
Michael D. Pawlovich
Traffic Safety and Crash Analysis Engineer
Iowa Department of Transportation
Highway Division, Office of Traffic and Safety
800 Lincoln Way
Ames, Iowa 50010

for:
2000-2004 Crash History
for the intersection of
US 75 and Co. Rd. C38
in Plymouth Co., Iowa

for years:
2000
Plymouth
Crashes: 3 Fatal: 0 Major: 0 Minor: 1 Possible/Unknown: 1 PDO: 1
Injuries: 4 Fatal: 0 Major: 0 Minor: 3 Possible: 1 Unknown: 0
2001
Plymouth
Crashes: 5 Fatal: 0 Major: 0 Minor: 0 Possible/Unknown: 1 PDO: 4
Injuries: 1 Fatal: 0 Major: 0 Minor: 0 Possible: 1 Unknown: 0
2002
Plymouth
Crashes: 5 Fatal: 0 Major: 0 Minor: 1 Possible/Unknown: 3 PDO: 1
Injuries: 6 Fatal: 0 Major: 0 Minor: 1 Possible: 5 Unknown: 0

After a bit of computing time, a Feature Count report appears. This report shows the date and time of creation, which program was used, the analyst contact information, the location, and a year by year, county by county breakdown of the crash history. A total for all years and all counties is shown at the bottom.

This can be printed from ArcView, although the options are limited. More options for formatting the text are available if the text is copied into a word processor such as Microsoft Word.

Main

File	Count
Location	Query
Report	Display
Defaults	Session
Exit SAVER	Exit ArcView
Help

When done, click the Next button in the Answers dialog box to return to the Main dialog.
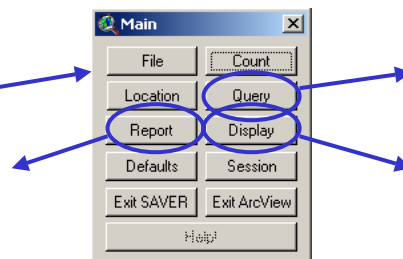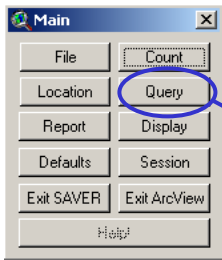
Now, options like Querying, Reporting, or altering the map Display are available to you. Each of these is optional.

Actually, the Count option was optional as well.

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Queries
and
Reports

SAVER Example

Main

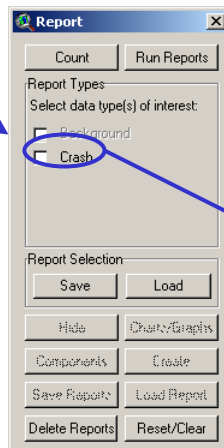|	
File	Count
Location	Query
Report	Display
Defaults	Session
Exit SAVER	Exit ArcView
Help	

To begin a query, begin at the Main dialog and click the Query button. However, as this was not requested, this step can be skipped. All possible crash attribute values are included by default. Querying limits these values to selected choices.
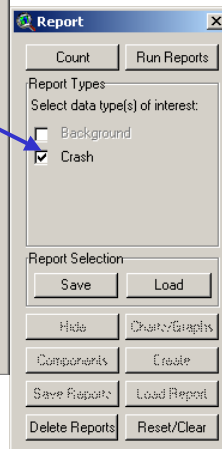
Not requested.

Main

File	Count
Location	Query
Report	Display
Defaults	Session
Exit SAVER	Exit ArcView
Help	
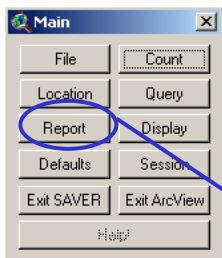
To begin a report, begin at the Main dialog and click the Report button. Select Crash and click Next.

Click Report.

Report

Count   Run Reports

Report Types
Select data type(s) of interest:
☐ Background
☐ Crash

Report Selection
Save   Load

Hide   Charts/Graphs
Components   Create
Save Reports   Load Report
Delete Reports   Reset/Clear

Report

Count   Run Reports

Report Types
Select data type(s) of interest:
☐ Background
☑ Crash

Report Selection
Save   Load

Hide   Charts/Graphs
Components   Create
Save Reports   Load Report
Delete Reports   Reset/Clear

Select Crash.

Click Next in the Answers dialog box.
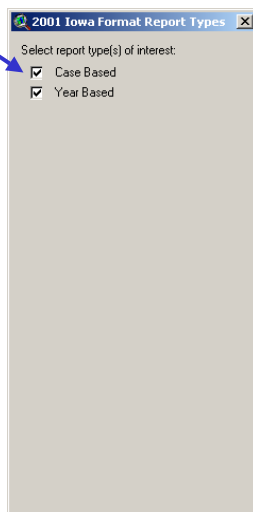
SAVER Example

Select the appropriate crash report form(s). 1979 Iowa Format is valid from 1979 thru 2000. 2001 Iowa Format is valid from 2001 thru 2005. Since data is desired that is both older and newer than 2001, both report forms should be selected. The reports for each format ARE different.

Click Next in the Answers dialog box.

Select the report type(s) of interest. Case Based reports list a variety of details about each case, depending on which Case Based report is selected. Year Based reports summarize a particular attribute by year. These reports list the number of crashes with the attribute included and report crash severity and injury severity information.

Select both types of reports. You will need to do this for both the 1979 and 2001 Formats.

Click Next in the Answers dialog box.

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SAVER Example
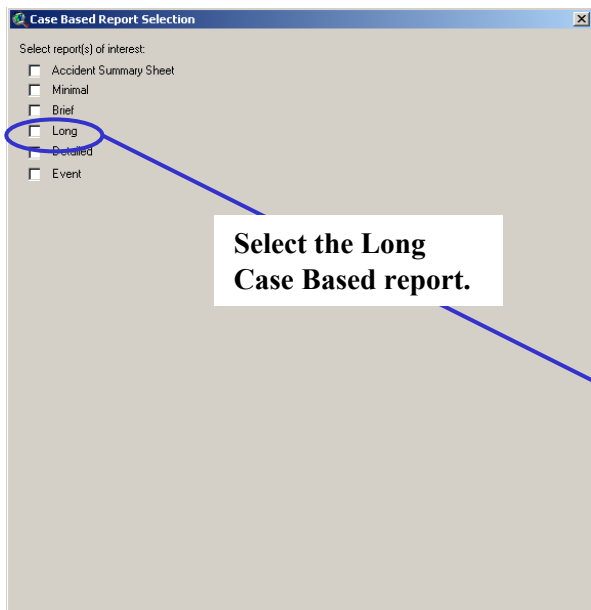
Case Based reports list different amounts of information and this is somewhat indicated by their names. Minimal reports list the least information and Detailed reports list the most. Brief and long list an amount of information between these two. The other reports are used for specific cases within the Iowa DOT Office of Traffic and Safety (TAS).

Select the Long Case Based report.
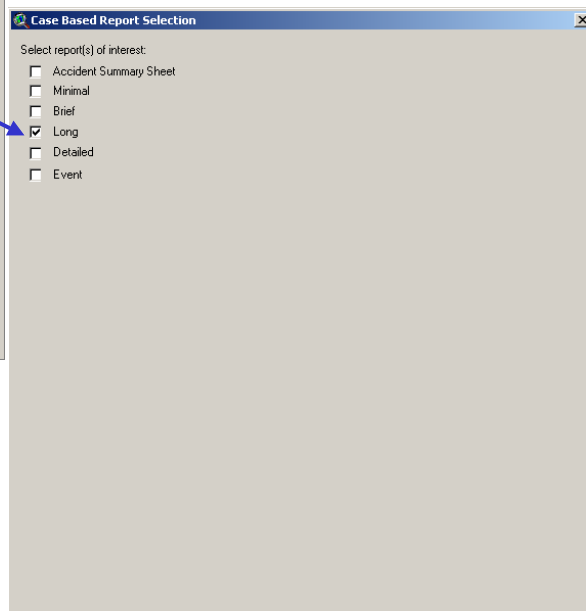
Click Next in the Answers dialog box.

SAVER Example

US 75 and Co. Rd. C38,
Plymouth County, 2000-2004

2001 Reports

Year Based reports summarize specific types of attributes. These types are indicated by the names. Select the indicated Year Based reports. Select whatever reports are deemed necessary for the location.

Select the indicated Year Based reports.

1979 Reports

Select the indicated Year Based reports.

Click Next in the Answers dialog box.

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SAVER Example

Location Description

Enter location description:

First Line: `2000-2004 Crash History`
e.g., "1996-2000 Crash History" or "1996-2000 Animal-Related Crashes"

Second Line: `for the intersection of`
e.g., "for the intersection of" or "for the link between"

Third Line: `US 75 and Co. Rd. C38`
e.g., "US 218 and 250th Ave" or "US 30 between Colo and State Center"

Fourth Line: `in Plymouth Co., Iowa`
e.g., "in Bremer Co., Iowa" or "(Fatal and Injury Crashes)"
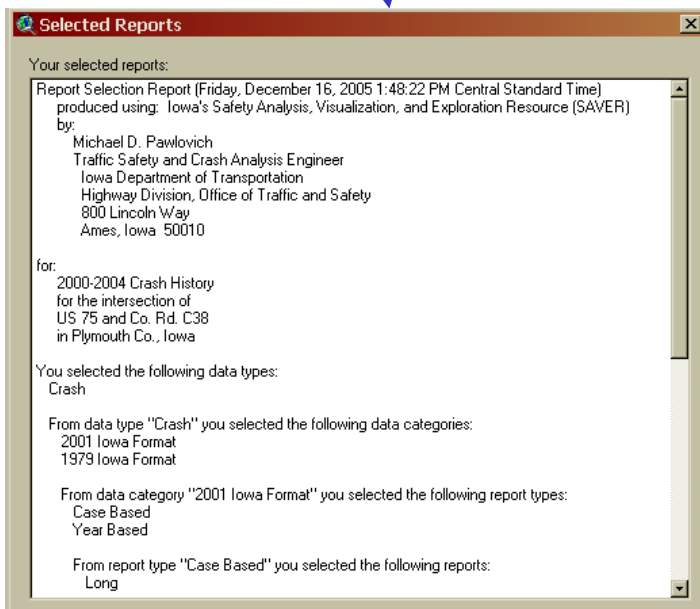
Note: None of these lines are required. Suggestions are provided below each line.

Following selection of the reports, the Location Description dialog appears again. The previous description will appear if you typed one in. Change it if you want.

Click Next in the Answers dialog box.

Selected Reports

Your selected reports:

Report Selection Report (Friday, December 16, 2005 1:48:22 PM Central Standard Time)
   produced using: Iowa's Safety Analysis, Visualization, and Exploration Resource (SAVER)
   by:
     Michael D. Pawlovich
     Traffic Safety and Crash Analysis Engineer
     Iowa Department of Transportation
     Highway Division, Office of Traffic and Safety
     800 Lincoln Way
     Ames, Iowa 50010

for:
   2000-2004 Crash History
   for the intersection of
   US 75 and Co. Rd. C38
   in Plymouth Co., Iowa

You selected the following data types:
   Crash

   From data type "Crash" you selected the following data categories:
     2001 Iowa Format
     1979 Iowa Format

     From data category "2001 Iowa Format" you selected the following report types:
       Case Based
       Year Based

       From report type "Case Based" you selected the following reports:
         Long

A report detailing your Selected Reports appears. You may print this, save it, or not. Review it. It should list the reports you selected.

Click Next in the Answers dialog box.

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Year-Based: Numerical or Textual

For year-based reports, which report type would you like?

○ Numerical

Creates reports that display zero values and report uninformative data rows (e.g., those with null values).

Numerical reports are useful for further manipulation within within a spreadsheet (e.g., Excel, Lotus, etc.).

However, numerical reports take longer to create.

○ Textual

Creates reports that don't display zero values and delete uninformative data rows (e.g., those with null values).

Textual reports are useful for reporting.

Textual reports take less time to create.

○ Both

Creates both numerical and textual reports.

A dialog asking what type of Year Based report you wish appears. The only choice should be Numerical. If not, select Numerical.

Click Next in the Answers dialog box.

The time these reports take to be developed depends on the number of active crash themes (i.e., number of years and number of counties), number of selected crashes, and number of reports selected. This is something that individual users will have to gain experience with as the report development time also depends on computer-specific capabilities (i.e., processor speed and available memory).

Each individual report will appear in the upper left, be developed, and its window hidden finished. The reports run in the order selected. The process is finished when the last report is hidden and no new report appears. Case Based reports will fill in as development is ongoing. Year Based reports will remain blank until the final write stage. If the progress bar is moving (or flashing very rapidly, depending on the things listed above) then SAVER is still running the reports.
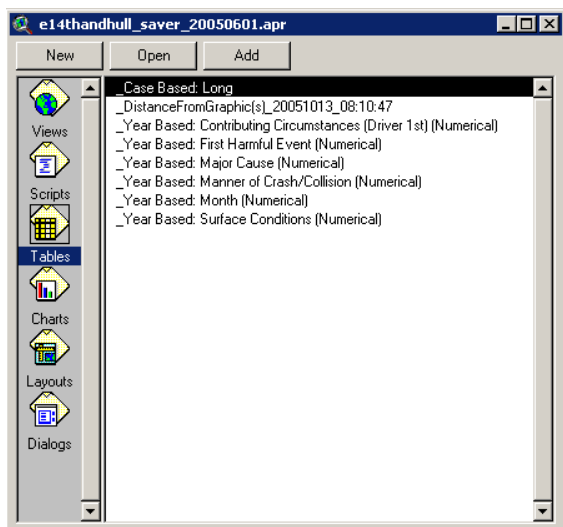
Once the selected reports have finished running, you will be returned to the Report Dialog.

The report windows will have been closed but they are still available within SAVER in two ways. The first is through the Project Window, which is shown to the left. Using the project window and highlighting the Tables icon, as shown, you can choose any of the reports individually and open them by double-clicking. This is the way to do it using ArcView's normal capabilities.
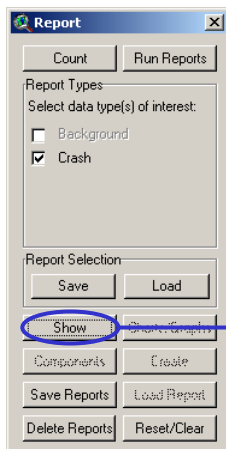
Alternatively, you can show the reports by clicking the show button on the Report Dialog. This is the way to do it using SAVER.

Click Show.
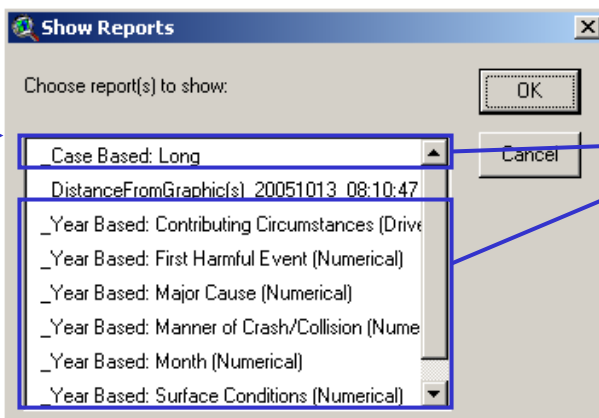
Highlight the reports of interest and click OK.

A list of the available reports (i.e., those you have created) appears. Click on and highlight those you are interested in. This selection is a toggle selection; therefore, if you select one accidentally, just click on it again and it will be unselected.

The selected reports will open. However, as all the report windows are placed in the same position and are the same size, you will see only one report. To see the others (which are underneath the top one) use your mouse to move the reports around the SAVER/ArcView area.

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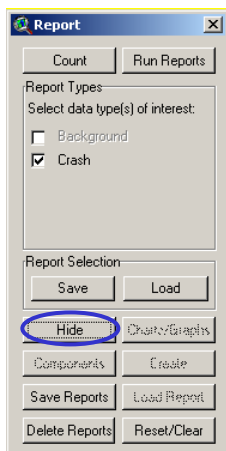
To close the report windows, you can click on the "X" in the upper right of the windows. This is the Windows or ArcView method of closing the windows.

Alternatively, you can click on the Hide button on the Report Dialog. The Hide button had previously been the Show button but when you clicked on it, it toggled to the Hide button. This brings up a Hide Reports dialog box similar to the Show Reports dialog box used to show the reports. Select the reports you wish to hide and click OK.
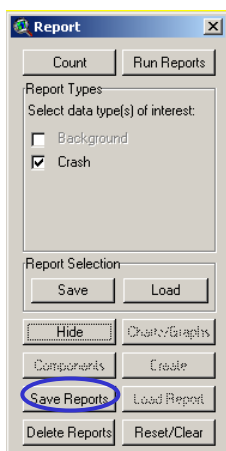
To save the reports for other purposes (e.g., opening them with Excel and making nicely formatted reports with lines, centering, titles, etc), click the Save Reports button on the Report Dialog. This will allow you to save each report to a user-defined directory.

A Save Reports dialog box then appears. Select the reports you would like to save in the same manner as when you wanted to show or hide the reports. When you click OK the following message is displayed.
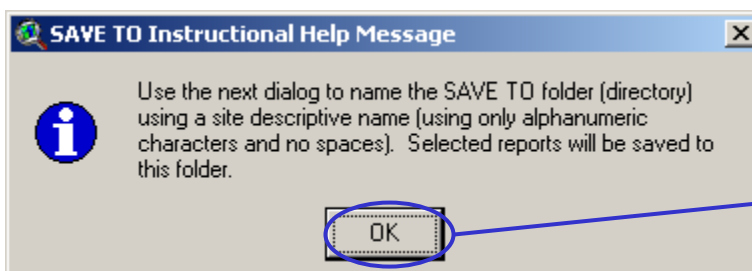
Click OK.

You can create a folder where you would like all of the reports you selected to be saved and SAVER will save all of them to that folder automatically. This is slightly different from previous versions of SAVER in that you had to save each report individually.

SAVER Example

In the User-Defined Save Folder dialog box, type in the name of the folder you would like to create to save the reports to in the File Name field.

When you click OK you are asked if you would like to save the entirety of the reports. Unless you have selected a subset of the report and have some reason for saving only that portion, click Yes. SAVER then saves all of the reports you selected to the folder that you had it create.
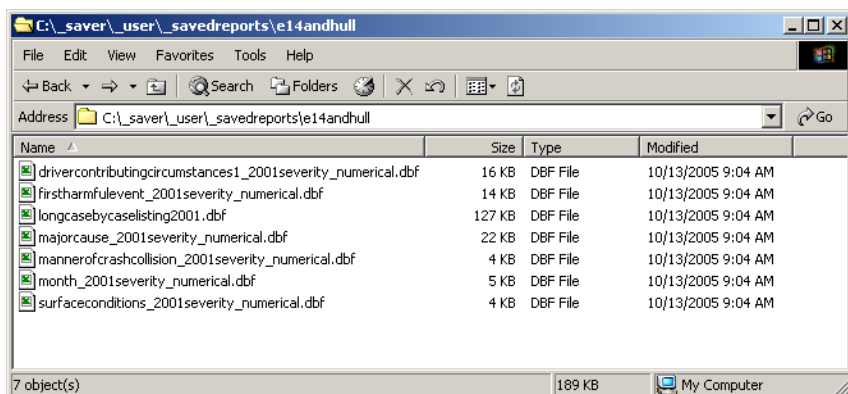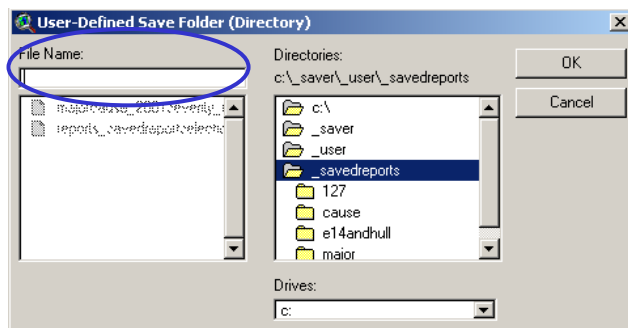
The recently saved reports appear here. Next, for the year-based reports, you can use the Excel templates that have provide standardized header and footer space, formatting, and calculations.

SAVER Example

To find the Excel templates, navigate to "C:_saver_user_excel_templates_crash\iowa_2001\" or "C:_saver_user_excel_templates_crash\iowa_1979\" as appropriate. Then find the appropriate year range, 5-year for this example.

Select the reports corresponding to the year-based reports you ran and saved.
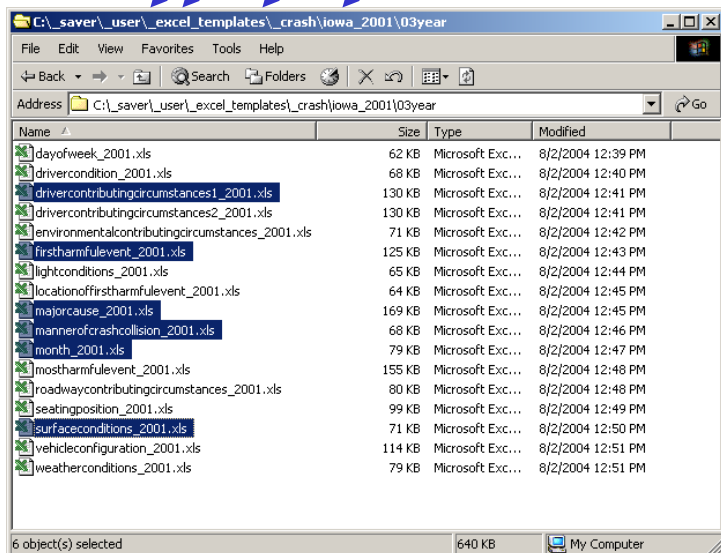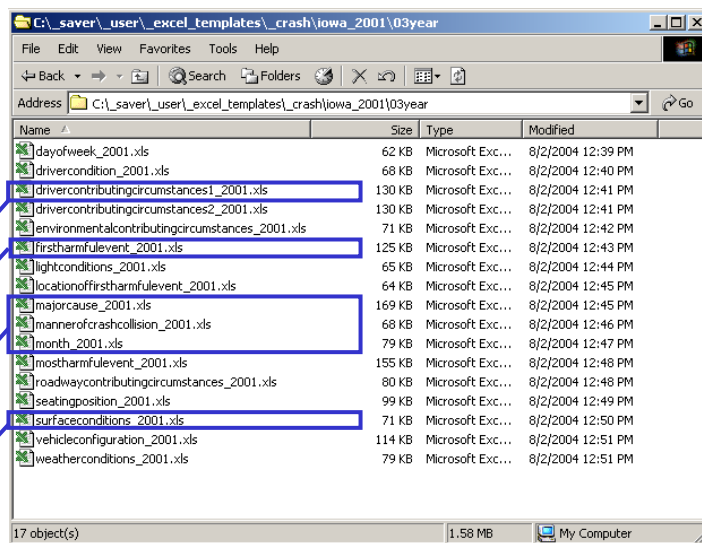
Copy these files. Navigate back to the folder where you saved the reports from SAVER and paste them.
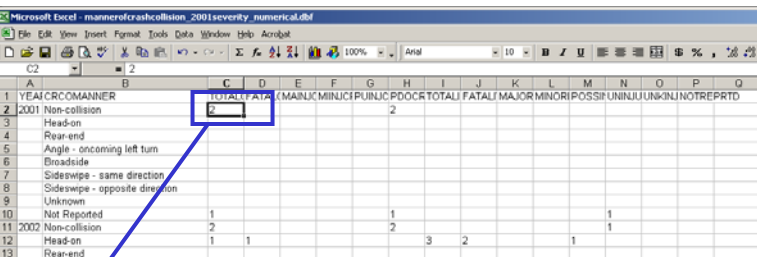
SAVER Example

Open one of the SAVER output year-based reports and its appropriate Excel template. If the dBase SAVER output files aren't targeted to open within Excel, you can change this or you can open Excel first, switch to opening files of type dBASE, and then open the file.
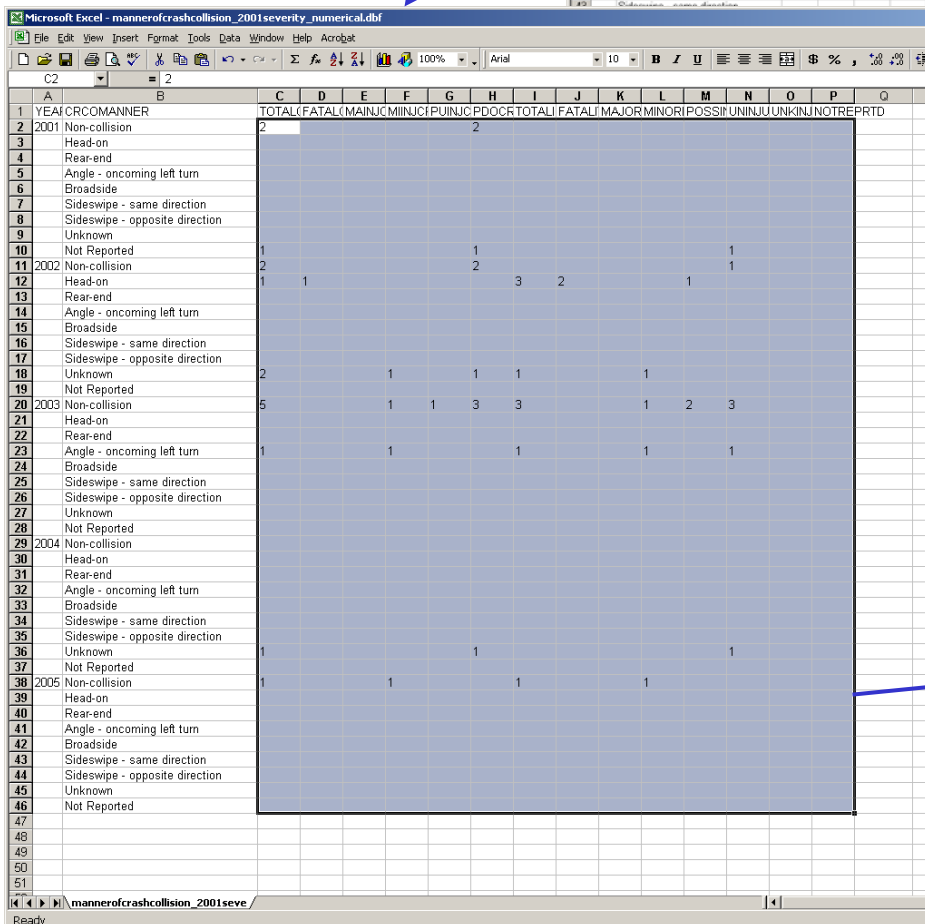
Excel should open with both files. If this isn't the case, open the other using Excel. Choose the File menu and the Open choice.

Switch to the SAVER output file (i.e., the dBase file). Place the cursor at the C2 element or position (i.e., in the C column on the 2nd row).

After the cursor is at position C2, hold the Shift key on your keyboard then, in order, depress the End key then the Home key. This highlights the spreadsheet table from C2 to the lower right extent.

Copy this. (Ctrl+C)

Switch to the Excel template. Before you can paste the data, you may have to unprotect the worksheets. To do this go to Tools>Protection>Unprotect Sheet. If you are prompted for a password, type in "saver" in all lower case.

Place the cursor at position C5. Paste the copied data here (Ctrl+V).

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Now switch to the HeaderFooter tab.

Here we can add some header and footer information that will be useful when printing out the data.

Next page...

SAVER Example

Information can be added in two locations.

Information can be pasted in here if copied from another source such as SAVER.

You can type information directly in here. This is usually the same information that was entered when doing the Feature Count Report in SAVER.

The description you type will automatically appear on the summary sheet.

Nothing needs to be done in the YearByYear tab. This could be printed as it appears if you wanted to see a Year by Year summary of the crashes.


The Summed tab contains a summary of the data. The only thing that might have to be done here is changing the years in cell A8. This could also then be printed.

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Do the same for the other output year-based reports (go back to page 25).

If you do all but the header/footer information, then open all the Excel templates simultaneously, you can copy and paste the description and footer between all the Excel templates.
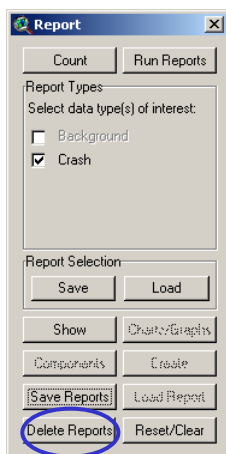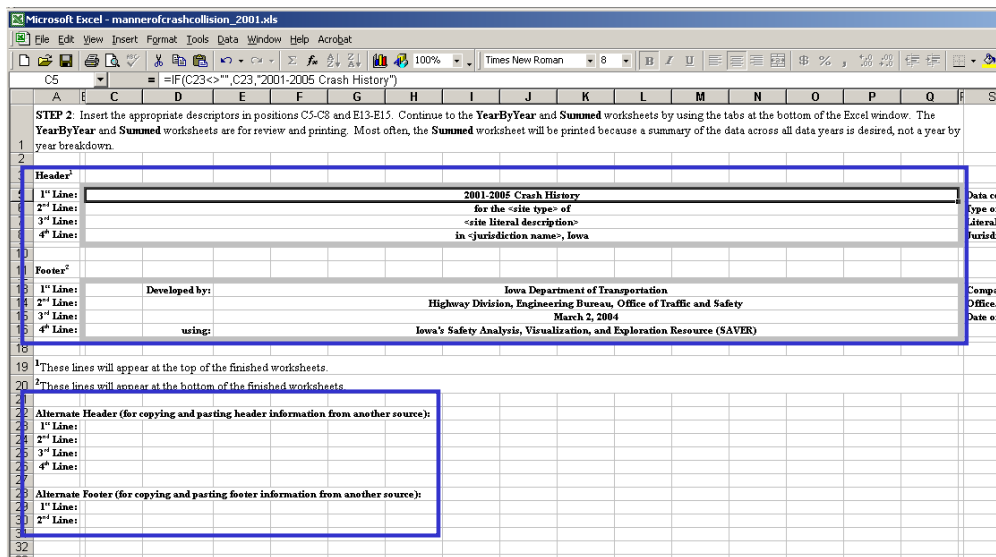
When done or before running further reports, delete the previously created reports. Begin by going back to ArcView SAVER and returning to the Report dialog.

Click the Delete Reports button.

A dialog showing the reports open. Select the reports to delete. Normally, all reports could be selected. Select the reports to delete and click OK. Looking at the Project Window again, all of the reports should be gone.
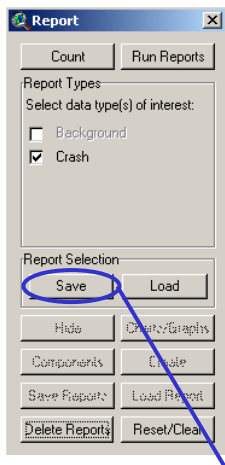
Next, you can save the selection of reports you had created. That is, you can save the fact that you had chosen to run a case-based report and 7 year-based reports in the 2001 Iowa Format and a case-based report and 10 year-based reports in the 1979 Iowa Format. Then, when you do another request, you can run these same reports by loading the report selection file and running reports. You might do this if you knew you'd always run the same reports for every data request you do. Using the saved report selection, you wouldn't have to progress through all the check boxes that you used to select the 19 reports you ran previously (8 new and 11 old).

**Click Save within the Report
Selection control panel.**

**In the Save Report Selection dialog box that comes
up, type in a descriptive term for your saved report
selection and click OK. You can only replace the
portion of the suggested filename prior to the
underbar ("_").**

To load the saved report selection, click Load on the Report dialog.

**Select the report selection to load in
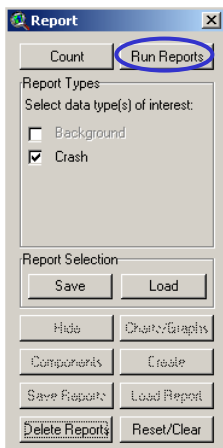the Load Report Selection dialog box
that comes up and click OK.**

**The report selection is loaded
and available for running.**
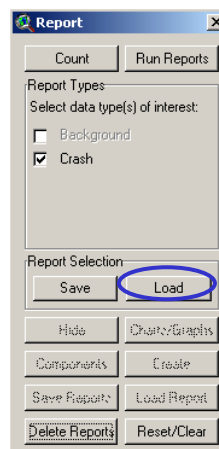
**To run the selected reports, click the Run
Reports button on the Reports dialog.**

**This button will run either loaded report
selections or previously selections made
during the same SAVER session.**

**Make sure the Numerical radio button is
selected and click Next in the Answers dialog
box. Progress as before (see page 21).**

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Create Collision Diagram

SAVER Example

**From the Main dialog box, select Display.
Then click Collision Diagram.**

**A dialog box comes up where you can give the Collision Diagram that
you are about to create a name. IMPORTANT-DO NOT USE
SPACES IN THE NAME!**

**ArcView SAVER will then run for a little while
as it creates the Collision Diagram.**

**When the Collision Diagram is created, it should appear in
a new window and look something like the following.**

SAVER Example

There are several options that can be changed with the map.
To change the properties of the map, go to the Diagram
Settings dialog box. There are two ways to accomplish this.

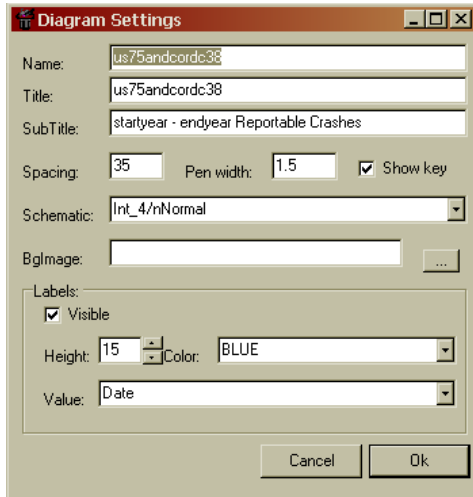The first way is to select the File pull-down menu and then
select Diagram Properties.
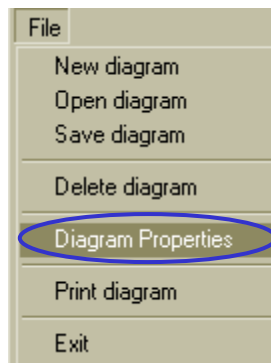
The second way is to click on the Diagram
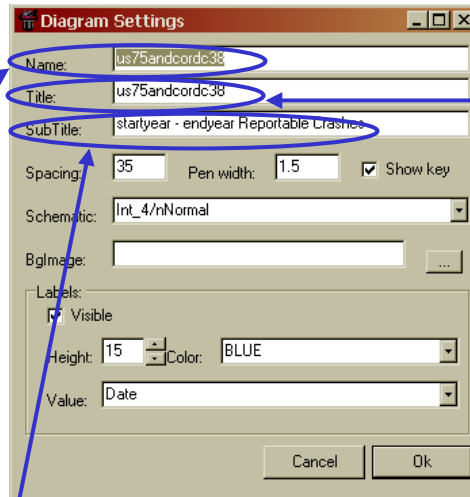Properties tool button on the toolbar.
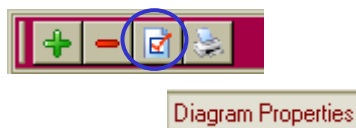
SAVER Example

The Diagram Settings dialog box should now be open.

As many or as few of these options can be changed as deemed necessary by the user.

The different options will be described here. Most of them are pretty self explanatory

In the Name field you can give the diagram a different name if you wish. This is the name you gave the diagram before it was created.

In the Title field you can give a different title to the diagram. This is what appears at the top of the diagram.
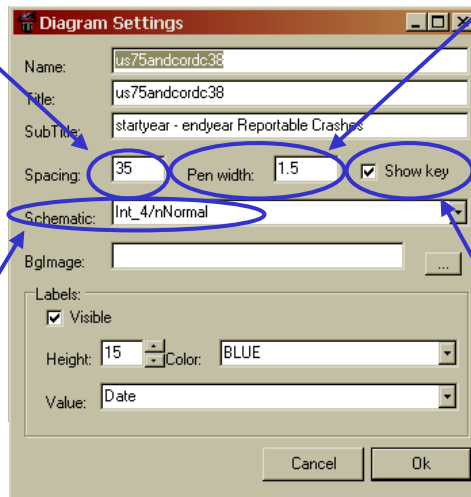
As the Subtitle field indicates, this changes the subtitle below the Title. This is usually the year of crash data.

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The Spacing is the spacing between the crashes in the diagram.

The Pen width is the width of the lines that the crashes are drawn width.

Diagram Settings
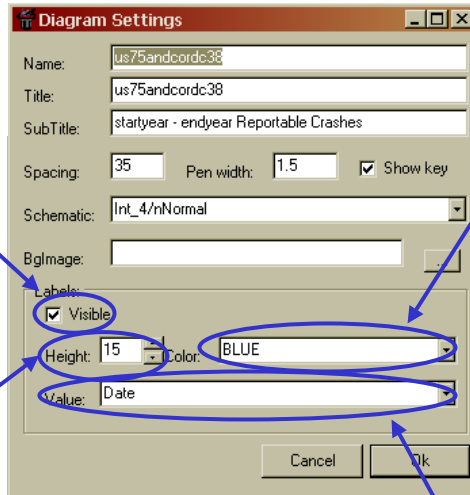
Name: us75andcordc38
Title: us75andcordc38
SubTitle: startyear - endyear Reportable Crashes
Spacing: 35   Pen width: 1.5   ☑ Show key
Schematic: Int_4/nNormal
BgImage:
Labels:
☑ Visible
Height: 15 Color: BLUE
Value: Date

Cancel   Ok

The Schematic field dictates the layout of the basic intersection of the diagram. There are many options here to chose depending on the geometry of your intersection.

If you would like the key shown at the bottom of the diagram, make sure the Show key check box has a check in it. It is recommended to have this option checked.

Label Options

If you would like the crashes labeled, make sure the Visible check box has a check in it. It is recommended to have this option checked.

The Color pull-down menu adjust the color of the labels.

The Height pull-down menu adjust the height of the labels.

The Value pull-down menu adjust what is displayed in the label.

When you have adjusted the settings how you would like them, click OK. The diagram will take a moment to render and redraw itself with the settings you selected.
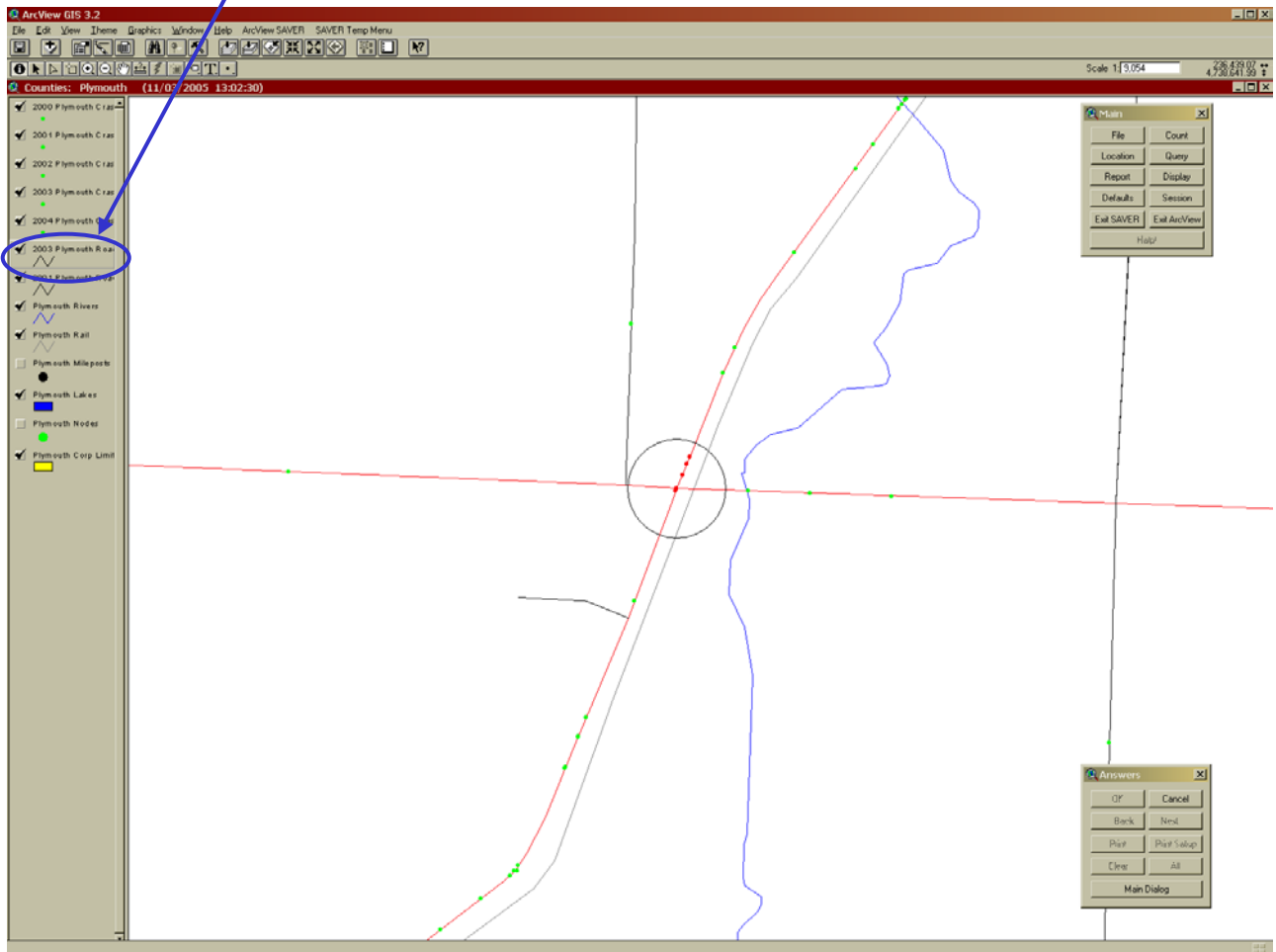
The Collision Diagram can then be printed. There are also two ways to print the diagram. You can select Print diagram from the File pull-down menu or click the Print Diagram button on the toolbar.

Calculate Crash Rate

SAVER Example

**Now a crash rate for the intersection will be calculated.
In the map window, make the road theme active.**

Next, click on the Identify tool.

**Then click on each leg of the intersection. A
Identify Results dialog box appears. This
contains information about that link of
roadway. The information that we are
looking for is the AADT. You may have to
make the box larger or scroll down to see
this information.**

**Note: Some of the links of roadways may pass through
the intersection. If this is the case, you may only see
three entries even though it is a 4-legged intersection.**